VNIVERSITAT DE VALÈNCIA

Course Guide
34463 Clinical radiology, physical medicine and rehabilitation

COURSE DATA

Data Subject	
Code	34463
Name	Clinical radiology, physical medicine and rehabilitation
Cycle	Grade
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Faculty of Medicine and Odontology	4	First term

Subject-matter

Degree	Subject-matter	Character
1204 - Degree in Medicine	11 - Diagnostic and therapeutic procedures	Obligatory

Coordination

Name	Department
CASANS TORMO, IRENE	260 - Medicine
DUALDE BELTRAN, DELFINA	260 - Medicine

SUMMARY

Theoretical-practical formation of future doctors in the field of the Clinical Radiology. The students, at the end of the course, must acquire the basic knowledge about the semiology foundations of the techniques used in Radiology and Diagnosis Imaging (Radiodiagnosis and Nuclear Medicine) in every organ and system, to know the most used image explorations in the study of the different corporal systems, their profitability and the use of the image in the clinical practice guides focused on each of the pathologies of the different organs and systems. The student must also know the therapeutic applications of the therapy guided by image and based on nuclear medicine.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

It is advisable to have passed General Radiology.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1204 - Degree in Medicine

- Understand the foundations of action, indications and efficacy of therapeutic interventions, based on available scientific evidence.
- Have the capacity to make an initial diagnosis and establish a reasonable strategy of diagnosis.
- Establish the diagnosis, prognosis and treatment, applying principles based on the bestinformation available and on conditions of clinical safety.
- Acquire properclinical experience in hospitals, health care centres and other health institutions, under supervision, as well as basic knowledge of clinical management focused on the patient and the correct use of tests, medicines and other resources available in the health care system.
- Know how to use the sources of clinical and biomedical information available, and value them critically in order to obtain, organise, interpret and communicate scientific and sanitary information.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- Keep and use medical records which contain information about the patient for later analysis, preserving the confidentiality of personal data.
- In the professional practise, take a point of view which is critical, creative, constructive and research-oriented.
- Understand the importance and the limitations of scientific thinking in the study, prevention and management of diseases.
- Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.
- Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently,as well as to their relatives, the media and other professionals.
- Proper organisation and planning of the workload and timing in professional activities.
- Team-working skills and engaging with other people in the same line of work or different.
- Criticism and self-criticism skills.

- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.
- Evaluate the risk-benefit balance of diagnostic and therapeutic procedures.
- Is aware of the indications in biochemical tests, as well as haematological, immunological, microbiological, anatomical and pathological, and image tests.
- Knows the foundations of radiation interaction with the human body.
- Understands the foundations of basic radiological semiology of various organs and systems.
- Knows other techniques to obtain diagnostic image.
- Assesses indications and contraindications of radiological studies.
- Is able to apply radiological protection criteria within the diagnostic and therapeutic procedures with ionising radiation.
- Knows the principles and indications of radiotherapy.
- Is able to interpret a radiological image through systematic reading.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

At the end of the course, students must be able to:

1. Reason and to relate the findings of the different procedures of the Diagnosis Imaging.
2. Identify normal anatomical structures and the basic semiology in Diagnosis Imaging of the main diseases in the different organs and systems.
3. Explain the indications of the main explorations in Diagnosis Imaging. To know the profitability of the radiological and nuclear medicine explorations normally used in the study of each part of the human body, as well as the essential data of the acquisition techniques.
4. Describe the main explorations in the study of each organ or system.
5. Evaluate what information is intended to achieve when each test is made.
6. Analyze the data obtained in each type of exploration and their relation with the provided diagnosis.
7. Identify the radiological and nuclear medicine signs of the most prevalent diseases.
8. Relate and prioritize the indications of the different diagnosis imaging procedures in the most prevalent diseases.
9. Identify the radiological signs that establish the diagnosis in situations of vital risk.
10. Relate and prioritize the indications of the different diagnosis imaging procedures in the situations of vital risk.
11. Know and to know how to explain the most important therapeutic procedures that can be performed in Radiology, including the general interventionism, the endovascular therapy and the therapy in Nuclear Medicine.
12. Develop skills to solve diagnostic problems through image techniques, with academic competences (do properly what it is meant to do) and critical judgment of the scientific and interpretative bases and the solving problems from the content of the subject.

DESCRIPTION OF CONTENTS

1. THEORY (Lessons 1 at 7)

1. Introduction to radiodiagnosis: digital image and storage systems. The revolution of the image in the personalized medicine. Information and general plan of the course.
2. Diagnosis imaging in the central nervous system diseases. Techniques of structural and functional neuro-images. CT and MR: historical evolution, advantages, disadvantages, main sequences and indications.
3. Diagnostic imaging in head and neck diseases. Imaging techniques. Skull base, orbit and temporal bone.
4. Diagnostic imaging in diseases of the facial and cervical region. Inflammatory disorders. Bone lesions. Benign and malignant tumors. Adenopathies.
5. Diagnosis imaging in the pulmonary parenchyma diseases. Image techniques. Air space disease. Pulmonary collapse. Interstitial pulmonary disease. Air ducts disease. Nodules and pulmonary masses.
6. Diagnosis imaging in the mediastinum and pleura diseases. Image techniques. Thoracic aorta. Mediastinum. Pleura, thoracic wall and diaphragm.
7. Diagnostic imaging in diseases of the heart. Ischemia, valve disease, cardiomyopathies, masses and tumors. Pericardium.

2. THEORY (Lessons 8 at 14)

8. Diagnostic imaging in diseases of the liver, bile duct and pancreas. Diagnosis and staging of the main tumors. Inflammatory and storage diseases. Image in gallbladder and bile duct injuries (I).
9. Imaging diagnosis in diseases of the liver, bile duct and pancreas. Diagnosis and staging of the main tumors. Inflammatory and storage diseases. Image in gallbladder and bile duct injuries (II).
10. Diagnostic imaging in diseases of the urinary and adrenal system. Tumor, inflammatory and obstructive lesions of the kidney and urinary system. Adrenal injuries and tumors. Male genital system, including lesions of the prostate (I).
11. Diagnostic imaging in diseases of the urinary and adrenal system. Tumor, inflammatory and obstructive lesions of the kidney and urinary system. Adrenal injuries and tumors. Male genital system, including lesions of the prostate (II).
12. Diagnostic imaging in diseases of the digestive tract and peritoneum. Image of the main tumors, inflammatory and ischemic lesions of the digestive tract. Contribution of the image to peritoneal and mesenteric lesions (I).
13. Diagnostic imaging in diseases of the digestive tract and peritoneum. Image of the main tumors, inflammatory and ischemic lesions of the digestive tract. Contribution of the image to peritoneal and mesenteric lesions (II).
14. Diagnostic imaging in women's diseases (breast and female genital tract). Detection and characterization of breast neoplasia. Other breast lesions. Diagnosis, staging and monitoring of lesions of the female genital system. Congenital malformations.

3. THEORY (Lessons 15 at 24)

15. Image-guided therapy: general interventionism. Use of Image-Guided Minimally Invasive Therapy. Treatment and monitoring of injuries.
16. Diagnostic imaging in diseases of the vascular system. Endovascular Image Guided Therapy. Historical evolution. Peripheral vascular interventional radiology. Interventional neuroradiology. Techniques and indications.
17. Diagnostic imaging in diseases of the spine and spinal cord. Conventional radiology: anatomy and semiology. CT and MR: indications. Spinal and cord injuries. Degenerative and inflammatory lesions of the spine
18. Diagnostic imaging in pediatrics: differential features.
19. General bases of Nuclear Medicine. Equipment and tracers. Nuclear Medicine Techniques: Scintigraphy, SPECT and PET. Radionuclides and radiopharmaceuticals.
20. Nuclear Medicine in Oncology: planar bone scintigraphy and SPECT. Detection of sentinel lymph node and radioguided surgery.
21. PET/CT in Oncology. PET/MR and Micro-PET
22. Nuclear Cardiology: myocardial perfusion. Ventricular function. Sympathetic innervation. Necrosis and cardiac amyloidosis. Cardiovascular PET and infection devices.
23.Nuclear Medicine in Endocrinology: Thyroid and parathyroid pathology suprarenal glands. Neuroendocrine tumors.
24. Nuclear Medicine Therapy. Concept of Theragnosis. Hyperthyroidism and Thyroid Cancer. Bone metastases. Synoviorthesis. Neuroblastoma. Radioembolization. Radiolabeled peptide therapy.

4. SEMINAR PRACTICES 1

1. Basic anatomy and semiology in neuroradiology. Sectional anatomy: axial, sagittal and coronal studies. Brain hemispheres. Cerebellum and posterior fossa. Brain stem. Meninges and subarachnoid space. Ventricles and CFS circulation.
2. Aspectos básicos de la Medicina Nuclear (gammagrafía, SPECT, PET).
3. Radiodiagnosis in CNS and spine. Clinical cases: ischemic and hemorrhagic ictus, inflammatory and infectious diseases, neoplasm pathology.
4. Basic anatomy and semiology in thoracic radiology. Clinical cases, reading and differential diagnosis.
5. Radiodiagnosis in the thorax diseases . Image of different diseases in the pulmonary and cardiac parenchyma.
6. Nuclear Medicine in Nephro-urology: Renal scintigraphy. Renogram. Glomerular filtration. Renovascular hypertension. Kidney transplant. Nuclear Pediatrics: Bone and renal scintigraphy, cystography, Meckel's diverticulum, gastro-esophageal reflux in infants. Pediatric oncology. Pediatric sedation. Dosimetric considerations in pediatrics.

5. SEMINAR PRACTICES 2

7. Radiodiagnosis in obstetrics-gynecologic diseases and breast diseases. Clinical cases, semiology and proper use of the image.
8. Basic anatomy and semiology in the abdominal radiology. Clinical cases.
9.Nuclear Medicine in digestive pathology: Salivary glands. Esophageal and gastric transit. Biliary. Hemorrhages. Bile acid malabsorption. Intestinal infection. Splenosis. Nuclear Medicine in respiratory diseases: Pulmonary thromboembolism. Sarcoidosis. Pre-surgical pulmonary evaluation.
10. Basic anatomy and semiology in muscle-skeletal radiology. Radiodiagnosis in diseases of the backbone. Use of the image in the degenerative and neoplasm diseases of the backbone.
11. Nuclear Medicine in osteoarticular pathology: Benign bone pathology. Joint prosthesis. Metabolic, vascular, infectious, traumatic and sports pathology.
12. Radiodiagnosis in vascular diseases (diagnosis), percutaneous and endovascular treatment (neuroradiologic and general) in radiology.
13. Medicina Nuclear en el SNC: SPECT y PET. Demencia. Trastornos del movimiento. Accidente cerebro-vascular. Epilepsia. Tumor cerebral. Muerte cerebral. Detección de placa amiloide. Fístulas y derivaciones.

6. CLINCAL CASES

1. Radiodiagnosis in diseases of the locomotor system. Main techniques used to detect and evaluate the diseases of the joints and the bone.
2. Radiodiagnosis in pediatrics.

7. CLINICAL PRACTICES

Sessions of cases reading and identification of anatomical structures and injuries in radiodiagnosis.

CLINICAL PRACTICES OF NUCLEAR MEDICINE. Structure and functions of a Nuclear Medicine Service. Nuclear Medicine Techniques. Identification of anatomical structures and main pathologies in Nuclear Medicine.

WORKLOAD

ACTIVITY	Hours	% To be attended
Seminars	26,00	100
Theory classes	26,00	100
Clinical practice	23,01	100
Development of group work	50,00	0
Preparation of evaluation activities	25,00	0
TOTAL	**150,01**	

TEACHING METHODOLOGY

In the **theoretical lessons**, the teacher will expose, through master class, the most important concepts and contents in a structured way, to obtaining the knowledge and skills that the students must acquire. The students' participation will be encouraged. The teaching materials used by the professor will be available, if he considers it appropriate, through the electronic resource Aula Virtual.

Classroom practices: **seminars**. In small groups, the teacher will set specialized topics in depth, case studies, bibliography handling, current topics… the group work and oral presentation will be encouraged. It can be understood as "cooperative learning".

Clinical practices: students' clinical practices in sanitary services in the different university hospitals, primary health centres, mental health centres, public health areas, in order to learn how to perform an anamnesis and basic clinical explorations, with a first contact with patients, supervised by the professor.

EVALUATION

Final exam, multiple-choice type with 100 questions (4 possible answers and only 1 correct). 50 questions will be related with the theoretical part of the subject. The other 50 questions will correspond to the practical part and the seminars and, among them, 10 questions will diagnostic images will be included.

Each wrong question will subtract 0,33 points.

The maximum grade of the exam will be of 100 points. The subject can be passed independently from the amount of right answers in the theoretical or practical part. In order to pass the subject, the student must obtain in the exam, at least, 50 points.

Attendance to practical sessions is mandatory. Unjustified non-attendance to more than 20% of the sessions will make it impossible to pass the course.

In order to access to an advance on the call of this subject, it is a requirement that the student has coursed all his/her practices.

Students are reminded of the importance of carrying out evaluation surveys on all the teaching staff of the degree subjects.

REFERENCES

Basic

- Del Cura, J.L.; Pedraza, S.; Gayete, A.; & Rovira, A. (Eds.). Radiología esencial. 2ª edición. 2018, SERAM, Editorial Médica Panamericana.
- Herring, W. Learning radiology. Recognizing the basics. 4ª edición. 2020, Editorial Elsevier.
- García Vicente, Martín Comín y Soriano Castrejón. Medicina Nuclear en la práctica clínica, Aula Médica, tercera edición, 2019.
- Biersack. Clinical Nuclear Medicine, Springer Verlag, 2007
- M. Minoves y E. Riera. Nuclear Medicine Imaging in bening bone and joint diseases, Masson, 2005
- E. Noriega y J. Martin-Comín. Atlas de inflamación e infección en Medicina Nuclear, Aula Médica, 2017
- Ziessman H, O´Malley JP y Thrall, JH).Los requisitos en Medicina Nuclear, Elsevier 2007
- www.semnim.es/pages/formacion-casos-clinicos

Recursos-e Salut: ClinicalKey Student. Elsevier (Scopus, ScienceDirect):
uv-es.libguides.com/RecursosSalut/BibliotecaSalut