

**COURSE DATA****Data Subject**

|                      |               |
|----------------------|---------------|
| <b>Code</b>          | 36317         |
| <b>Name</b>          | Cardiac image |
| <b>Cycle</b>         | Grade         |
| <b>ECTS Credits</b>  | 4.5           |
| <b>Academic year</b> | 2023 - 2024   |

**Study (s)**

| <b>Degree</b>             | <b>Center</b>                      | <b>Acad. year</b> | <b>Period</b> |
|---------------------------|------------------------------------|-------------------|---------------|
| 1204 - Degree in Medicine | Faculty of Medicine and Odontology | 4                 | First term    |

**Subject-matter**

| <b>Degree</b>             | <b>Subject-matter</b>  | <b>Character</b> |
|---------------------------|------------------------|------------------|
| 1204 - Degree in Medicine | 18 - Optional subjects | Optional         |

**Coordination**

| <b>Name</b>              | <b>Department</b> |
|--------------------------|-------------------|
| BODI PERIS, VICENTE JOSE | 260 - Medicine    |

**SUMMARY**

A global overview of the main invasive and non-invasive cardiac imaging techniques will be presented. Regarding each technique, a brief exposition of its technical foundations, an approach to the images in healthy patients, the contributions of the technique in the most prevalent cardiac pathologies and how to indicate their performance in an appropriate and individualized way to reach the correct diagnosis through a reasoned use of resources. The implications of each technique will be addressed in the prognostic evaluation, treatment and prevention of complications of the most frequent heart diseases.

Seminars will be held that will include the discussion of real clinical cases of patients studied with cardiac imaging techniques, the decision processes involved in choosing each technique.



## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

Dirigida a estudiantes de cuarto y quinto curso de Grado de Medicina

## OUTCOMES

### 1204 - Degree in Medicine

- Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.
- Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.
- Understand and recognise the effects, mechanisms and manifestations of diseases over the structure and function of the human body.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- 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.

## LEARNING OUTCOMES

- Students will acquire an overall vision of the main techniques for heart imaging, both invasive and non-invasive. They will reach an approximation to imaging in healthy patients, the technical contributions in the most prevalent cardiac pathologies, and how to indicate their execution in a proper and individualised way, in order to reach the correct diagnosis through a rational use of resources. They will understand the implications of each technique in the prognostic evaluation will be addressed, as well as in the treatment and prevention of complications in the most frequent heart diseases.
- Students will be able to discuss real clinical cases of studied patients through heart imaging techniques, decision-making processes regarding the selection of techniques, differential diagnosis, prognostic stratification and the treatment of patients, highlighting the important role of anamnesis and physical examinations as first steps for an adequate selection of the most appropriate imaging technique. Students will also develop skills to do a presentation and discuss practical assignments related to heart imaging.



- Students will acquire the necessary skills for preparing several practical activities in this subject. They will be able to access bibliography and different websites regarding scientific societies constantly updated, in which students will revise lots of real clinical cases of heart imaging and their explanations. This will allow students make progress in an autonomous and steady way during knowledge acquisition of heart imaging techniques, both in the lessons and in the future. Also, it will help them do the practical work and prepare for their assessment.

## DESCRIPTION OF CONTENTS

### 1. THEORY

We will address the following issues during the on-site theoretical activities:

Doppler echocardiography  
Cardiac magnetic resonance  
Angio-CT  
Cardiac catheterization  
Nuclear cardiology

### 2. PRACTISE

Attendance at on-site practical activities will be mandatory. To pass the subject, the student enrolled for the first time must attend at least 80% of the on-site practical activities.

The following issues will be addressed during on-site practical activities:

Doppler echocardiography. Practical cases  
Cardiac magnetic resonance. Practical cases  
Angio-CT. Practical cases  
Cardiac catheterization. Practical cases  
Nuclear cardiology. Practical cases  
Discussion of online questionnaires  
Revision of images

**WORKLOAD**

| ACTIVITY                                     | Hours         | % To be attended |
|----------------------------------------------|---------------|------------------|
| Seminars                                     | 20,00         | 100              |
| Theory classes                               | 19,00         | 100              |
| Clinical practice                            | 6,00          | 100              |
| Development of group work                    | 4,00          | 0                |
| Development of individual work               | 4,00          | 0                |
| Study and independent work                   | 25,00         | 0                |
| Readings supplementary material              | 10,00         | 0                |
| Preparation of evaluation activities         | 10,00         | 0                |
| Preparing lectures                           | 5,00          | 0                |
| Preparation of practical classes and problem | 5,00          | 0                |
| Resolution of online questionnaires          | 4,50          | 0                |
| <b>TOTAL</b>                                 | <b>112,50</b> |                  |

**TEACHING METHODOLOGY**

El teaching methodology se basa en el desarrollo de tres tipos de actividades:

- **Theoretical actividades** en las que se presentan en la visión global de la main invasive y no invasiva cardiac imaging techniques. Regarding todas las tecnologías, en la exposición de sus técnicas fundamentales, se adaptan a las imágenes de los pacientes, las contribuciones de la técnica en el mosto prevalente cardiac patologías y para indicar su performance en la adecuada e individualizada como se realizan en reasoned use of resources. Las implicaciones de cada técnica deben ser addressed en la pronóstica evaluación, tratamiento y prevención de complicaciones del mosto frecuente heart diseases.

- **Practical actividades** en los seminarios se puede tener que se incluye la discusión de las reales clinicas casas de pacientes que se estudian con cardiac imagen técnicas, la decisión de las procesiones involucra en la performance de la técnica, la diferencia y la diagnosis, el pronostico , Underlining el relevante role de las anamnesis and physical examination a las iniciales steps para la adaptación de la mejora del mosto adecuado cardiac imaging technique.

- **Non on-site activities.** Preparación de theoretical and practical on-site actividades, practical work (individual or in groups) and practical and final evaluation. Las recomendaciones de referencia y diferentes páginas web de las ciencias sociales se proveen con constante updates, para que los estudiantes puedan llegar a review en multitud de las reales clínicas casas realizadas cardiac. Ello a través de la advance autonomously y continuously v knowledge of cardiac imaging techniques both durante periodico y en la futura, it se te da la práctica practical work and prepare la evaluacion.



Teaching se puede producir following sustainability criteria and from the appropriate gender perspective.

## EVALUATION

### EVALUATION OF THE FIRST CALL:

**-Theoretical evaluation:** 50% de final mark. Máximo resultado que puede obtenerse de esta section: 50 puntos. El examen es el de todos los estudiantes de los sujetos. Estan bien a tests con 25 múltiples opciones basadas en las generales contenidos a través de las teoreticas actividades como las in-site y non-site practical actividades. There will be 4 posibles answers to each question. El correcto answer is worth 2 points. El borrador o blank answers del no sustrato.

**-Practical evaluación:** 50% de final mark. It will consist of 3 sections:

1) Practical exam of cardiac imaging casos. 10% of the final mark. Máximo resultado que puede obtenerse de esta section: 10 points. Each student will comment orally 1 real case based on cardiac images. Para este examen el grupo debe dividirse en 2 subgroups que se lleva a cabo en 2 simultaneous sesiones (1 horas). Los estudiantes pueden remainar en un classroom until el grupo de campo ha completado el examen. El profesor está briefly discuss with each student the exposed case.

2) Preparation of a practical work individually or in groups (up to 3 students) focused on cardiac imaging techniques addressed during the teaching period. 10% of the final mark. Maximum score that can be obtained from this section: 10 points. It can be a clinical case or a review of the value of one or several cardiac imaging techniques in the diagnosis and management of a specific pathology. The written memory will be delivered through the “Aula Virtual” at most on the day prior to the moment when the practical examination of cardiac imaging cases is performed. As an orientation, the written memory will consist of 10 pages, on one side, double spaced and will include a title, summary, introduction, work development, conclusions, bibliography and figures. Students who wish to do so may present their work orally apart from delivering the written memory. The fact of presenting orally the practical work will be considered in the final mark of this part of the evaluation. Only students who perform the oral presentation will be able to obtain the maximum score (10 points, 10% of the final mark) in this section.





3) Participation and results obtained in the different continuous evaluation activities. 30% of the final mark. Maximum score that can be obtained from this section: 30 points. At the end of each teaching week, students will be given a questionnaire with 5 multiple-choice questions in relation to the material taught throughout the week. Each question will have 4 possible answers, the wrong or blank answers do not subtract. The questionnaires will be carried out in person. The marks obtained in the questionnaires throughout the course will be added up and the maximum score that can be obtained is 30 points (30% of the final mark).

Students who do not carry out for justified reasons at least 80% of the continuous evaluation activities, if they request it, will be given an oral evaluation instead, which will mean the total mark for this section.

**- Requirements to pass the subject:**

It is not necessary to pass the theoretical and practical evaluations separately.

It is not necessary to pass all sections listed above separately.

The requirement to pass the subject is to obtain a total of at least 50 points (sum of all sections).

To pass the subject, students enrolled for the first time must attend at least 80% of the practical on-line activities.

**-EVALUATION OF THE SECOND CALL:**

-The mark obtained in the first call in the practical evaluation (50% of the total) will be maintained for the second call.

-The theoretical evaluation of the second call will represent 50% of the mark in this call and will have the same characteristics as in the first call.

## REFERENCES

### Basic

- Bodí Peris V, Chorro Gascó FJ (eds): Imagen cardiaca. Valencia. Universidad de Valencia, 2015.
- Chorro Gascó FJ (ed.): Ecocardiografía-Doppler. Valencia, Universidad de Valencia, 2011.
- Recursos-e Salut: ClinicalKey Student. Elsevier (Scopus, ScienceDirect):  
[uv-es.libguides.com/RecursosSalut/BibliotecaSalut](http://uv-es.libguides.com/RecursosSalut/BibliotecaSalut)



### Additional

- Chorro Gascó FJ, García Civera R y López Merino V (eds.): Cardiología Clínica. Valencia, Universidad de Valencia, 2007.

- Mann DL, Zipes DP, Libby P, Bonow RO (eds): Braunwalds Heart Disease. A Textbook of Cardiovascular Medicine. Elsevier, 10ª edición, 2015.

Foro de técnicas de imagen

<http://www.secardiologia.es>

<http://www.ecocardio.com/index.asp>

Foro de casos de ecocardiografía

<http://www.ecosiac.org/casos.php>

Foro de casos de resonancia magnética cardíaca

<http://www.scmr.org/navigation/CMR-in-specific-circumstances.html>

<http://www.scmr.org/caseoftheweek.html>

Foro de casos cateterismo cardíaco

<http://www.pconline.com/Clinical-cases>

Foro de cardiología nuclear

<https://www.asnc.org/content.asp?admin=Y&contentid=353>

<https://humanhealth.iaea.org/HHW/NuclearMedicine/CardiovascularandPulmonary/TeachingCases/index.html>