

**COURSE DATA****DATA SUBJECT****Code:** 36319**Name:** Fundamentals of Intensive Care and Techniques for the Treatment of Severe Pain**Cycle:** Undergraduate Studies**ECTS Credits:** 4.5**Academic year:** 2025-26**STUDY (S)**

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Facultat de Medicina i Odontologia	5	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1204 - Degree in Medicine	Optional subjects	ELECTIVES

COORDINATION

DE ANDRES IBAÑEZ JOSE ANTONIO

SUMMARY

This subject is designed to provide students with an understanding of the general aspects of intensive care and the treatment of acute and chronic pain in patients, as a complement to the knowledge acquired in the Anesthesia course included in the Diagnostic and Therapeutic Procedures module in the 3rd year of the Degree.

In the **area of Intensive Care knowledge**, students will mainly learn: the general aspects of intensive care, the type of patient and their common characteristics; general care; sedation and analgesia, and complications related to ICU stay. Regarding the airway, students will study the pathophysiology, diagnosis, and treatment of acute respiratory failure and Acute Respiratory Distress Syndrome (ARDS). They will learn to maintain airway patency and understand the different modes of oxygen therapy and invasive and non-invasive ventilation, as well as their monitoring. They will learn about the types of shock, their diagnosis, and clinical management. Neurological function and its multimodal monitoring will be addressed, including the diagnostic criteria for brain death. Students will understand diagnostic techniques and treatment for the most common infections in critical care, the prevention and risk factors of nosocomial infections and their surveillance methods, as well as the treatment of sepsis and multiorgan failure.

In the **area of knowledge related to the treatment of acute and chronic pain**, students will learn to assess



pain as an individualized element in the clinical semiology of a patient. They will understand the principles of action of analgesic drugs used in pain treatment and how to use them effectively. They will become familiar with both general and regional analgesic techniques. From there, students will be able to plan appropriate treatment for both surgical and non-surgical pain, as well as the prevention of chronic pain. Finally, students will understand the difference between an acute pain treatment unit and the general aspects of multidisciplinary units for chronic pain treatment, including the type of patient and their common characteristics. They will learn how to properly refer a patient to a specialized pain treatment unit and will understand the specialized pain treatment techniques performed in multidisciplinary chronic pain treatment units.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

-

Acknowledge diversity and multiculturality.

Capacity for communicating with professional circles from other domains.

Consideration of ethics as a fundamental value in the professional practise.

Criticism and self-criticism skills.

Proper organisation and planning of the workload and timing in professional activities.

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.

Team-working skills and engaging with other people in the same line of work or different.

Understand and recognise source agents and risk factors which determine health status and the development of diseases.

Understand and recognise the effects, mechanisms and manifestations of diseases over the structure and function of the human body.



Working capacity to function in an international context.

DESCRIPTION OF CONTENTS

1. THEORETICAL LESSONS PROGRAM

1. Generalities about Intensive Care. The critical patient. Assessment and prognosis scales.
2. Respiratory failure. Principles and methods of monitoring mechanical ventilation.
3. Circulatory failure. Principles and methods of hemodynamic monitoring.
4. Liver and kidney failure. Principles and methods of extrahepatic and extrarenal support.
5. Brain death. Diagnosis and management of organ donors for transplant.
6. Physiological bases of pain. Anatomy and physiology in the transmission and modulation of pain and in the evolution of acute to chronic pain. Prevention of chronic pain.
7. Musculoskeletal pain: myofascial, joint. Mixed pain. The rachis as an example.
8. Visceral pain. Neuropathic pain. Neuropathy and complex regional pain.
9. Pain in the cancer patient. Specific strategies.
10. Interventional techniques specialized in the treatment of chronic pain.

2. PRACTICAL TRAINING

SEMINARS - ANALYSIS OF CLINICAL CASES

1. How to administer severity scales and subsequently calculate prognosis in patients admitted to the Intensive Care Unit.
2. Patient with acute respiratory distress syndrome: Calculation of compliance, resistance, etc. values.
3. Patient with septic shock: Assessment of hemodynamic parameters and response to treatment.
4. Patient with hepatorenal syndrome: Adjustment of the hemofiltration system and consideration of extracorporeal liver support.
5. Planning for brain death, potential organ donor.
6. Pain management in patients with spinal cord disease: Critical analysis and decision-making rationale.
7. Treatment of musculoskeletal pain: Critical analysis and decision-making rationale.
8. Pain management in patients with complex regional pain syndrome: Critical analysis and decision-making rationale.
9. Pain in cancer patients. Critical analysis and decision-making rationale for both therapies and palliative care.
10. Pain management in patients with cervical headaches. Critical analysis and decision-making rationale.

CLINICAL PRACTICES.

Viewing and performing procedures in

- a) Intensive Care Unit (ICU) and Post-anesthetic Recovery Unit.
 - b) Outpatient consultation, technical room and operating rooms, Pain Unit.
- University Clinical Hospital and Malvarrosa Hospital. General University Hospital Consortium.
2 practices in the Intensive Care Unit (ICU).
2 practices in the Pain Unit.

**WORKLOAD****PRESENCIAL ACTIVITIES**

Activity	Hours
Theory	19,00
Seminars	16,00
Laboratory	0,00
In-class tutorials	0,00
Clinical practice	10,00
Total hours	45,00

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	19,00
Individual or group project	10,00
Independent study and work	24,00
Preparation of lessons	5,00
Preparation for assessment activities	4,50
Resolution of case studies	5,00
Preparation of supplementary reports	0,00
Preparation of the internship report and evaluation of the internship	0,00
Total hours	67,50

TEACHING METHODOLOGY

Classes with theoretical content will be given in person. Audiovisual support will be provided to the student through the virtual classroom.

Seminars. With proposals of real cases that must be analyzed and studied by the group. Group interactivity will be sought through oral presentations and examples in the classroom, counting in continuous evaluation. In total 10 thematic units in 10 class hours.

Clinical practices. In-person modality in which the theoretical concepts will be developed in a practical way in their application in patients admitted to the Intensive Care Unit, or outpatients for their study and completion of clinical history and/or performance of chronic pain treatment techniques. These small group practices will be carried out with real patients so that students can develop skills.

The gender perspective, respect for diversity and the sustainable development goals (SDGs) will be incorporated into teaching, whenever possible.

EVALUATION

Theoretical evaluation: 50% of final grade. It will be carried out through a written test that will cover the contents of the theoretical program. It will aim to evaluate the acquisition of knowledge. It consists of:



- Multiple response question test. It will consist of 30 multiple choice multiple choice questions with 4 options and a single valid answer. Each correct question adds 1 point and the wrong ones subtract 0.33 points. Blank questions do not add or subtract.

It is a requirement to have passed the theoretical evaluation to be able to access the final evaluation. If the theoretical evaluation is failed, the subject is considered failed. If the theoretical evaluation is passed, the final grade is adjusted with the evaluation proration as specified.

Practical evaluation: 50% of the final grade. It will be carried out through continuous evaluation of participation in the different internship activities and with the completion of a multiple-choice test that evaluates the acquisition of skills related to the contents and clinical cases.

- Multiple response question test. It will consist of 30 multiple choice multiple choice questions with 4 options and a single valid answer. Each correct question adds 1 point and the wrong ones subtract 0.33 points. Blank questions do not add or subtract.

It is a requirement to access the advance call for this subject that the student has completed all of his/her practices.

Attendance at practical activities is mandatory. The student is considered to meet this requirement if he or she has attended a minimum of 80% of these activities and has adequately justified the impossibility of attending the remaining sessions due to the occurrence of a cause of force majeure. It will be essential to comply with this requirement to pass the subject.

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

REFERENCES

Basic References

Intensive Care Fundamentals

1. Belda FJ, Llorens J. Ventilación mecánica en anestesia y cuidados críticos. Arán, 2009.
2. Whiten C, Soni N, Jackson G. Practical Procedures In Anaesthesia And Critical Care. Oxford University Press, 2010
3. Vincent JL, Abraham E, Kochanek P, Moore FA, Fink MP. Textbook of Critical Care: Expert Consult Premium Edition - Enhanced Online Features and Print (textbook of critical care, Shoemaker). Saunders, 2011.



4. Vincent JL (Ed). Yearbook of intensive care and emergency medicine. Springer 2006-2011.
5. Rippe JM, Irwin RS. Intensive Care Medicine 7^aed. Lippincott Williams & Wilkins, 2011
6. Nacul FE. Surgical Intensive Care Medicine. Springer, 2010
7. Adams JP, Bell D, McKinlay J. Neurocritical Care. Springer, 2010
8. Frankel HL, Boisblanc BP. Bedside Procedures for the Intensivist. Springer, 2010
9. Criner GJ, Barnette RE. Critical Care Study Guide. Springer, 2010
10. Smith FG, Yeung J. Core Topics in Critical Care Medicine. Cambridge University Press, 2010

Internet sources

1. Sociedad Americana de cuidados críticos: SCCM <http://www.learnicu.org/Pages/default.aspx>
2. Curso de la Sociedad Americana: SCCM resident ICU course <http://www.learnicu.org/Fundamentals/RICU/Pages/default.aspx>
3. European Society of Intensive Care Medicine Entrenamiento en cuidados de pacientes agudos.
<http://www.esicm.org/Data/ModuleGestionDeContenu/Pages/Generees/03-education/0B-pact-programme/25.asp>
4. Critical Care medicine tutorials <http://www.ccmtutorials.com/>
5. New England Journal of Medicine (vídeos) <http://www.nejm.org/multimedia/medical-videos>
6. The Merck Manuals Online Medical Library <http://www.merck.com/mmpe/sec06.html>
7. SCCMs Critical Care de formación cruzada para no especialistas en críticos <http://www.learnicu.org/Pages/default.aspx>

-Fundamentals of techniques for the treatment of acute and chronic pain

- 1.- Rogers JN. Toma de decisiones en el tratamiento del dolor. Elsevier.2007
- 2.- Waldman S. Atlas de Síndromes dolorosos frecuentes. Elsevier.2003
- 3.- Waldman S. Atlas de Síndromes dolorosos poco frecuentes. Elsevier.2004
- 4.- Raj P. Tratamiento



Practico Del Dolor. Elsevier 2001.

5.- Serra J. Tratado de dolor neuropático. Editorial panamericana. 2007.

6.- Miguel Angel Reina (editor), José Antonio De Andrés (editor), Admir Hadzic (editor), Alberto Prats-Galino (editor), Xavier Sala-Blanch (editor), André A.J. van Zundert (editor).Atlas of Functional Anatomy for Regional Anesthesia and Pain Medicine Human Structure, Ultrastructure and 3D Reconstruction Images. 2015.Springer Nature Link

7.-Practice Guidelines for Chronic Pain Management. An Updated Report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain MedicineAnesthesiology 2010; 112:810 833

8.- Unidad de Tratamiento del Dolor . Estandares y recomendaciones . MINISTERIO DE SANIDAD Y POLÍTICA SOCIAL CENTRO DE PUBLICACIONES. 2011

http://www.msc.es/organizacion/sns/planCalidadSNS/docs/EERR/Unidad_de_tratamiento_del_dolor.pdf

9.- Unidad de Cuidados Paliativos . Estandares y recomendaciones . MINISTERIO DE SANIDAD Y POLÍTICA SOCIAL CENTRO DE PUBLICACIONES.2009 <http://www.msc.es/organizacion/sns/planCalidadSNS/docs/cuidadospaliativos.pdf>

10.- Institute for Clinical Systems Improvement (ICSI). Assessment and management of chronic pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2007 Mar. 87 p. Citada el 10 de junio de 2008. Disponible en: www.icsi.org.

11.- Attal N, Cruccu G, Haanpaa M, Hansson P, Jensen TS, Nurmikko T, et al. EFNS Task Force. EFNS guidelines on pharmacological treatment of neuropathic pain. Eur J Neurol 2006 Nov;13(11):1153-1169. Disponible en: <http://www.guideline.gov>.

12.-Dworkin RH, OConnor AB, Backonja M, Farrar JT, Finnerup NB, Jensen TS, et al. Pharmacologic management of neuropathic pain: evidence-based recommendations. Pain 2007 Dec 5;132(3):237-51. Disponible en: http://www.guideline.gov/summary/summary.aspx?doc_id=11724&nbr=6049#1146 13.- Boswell MV, Trescot AM, Datta S, Schultz DM, Hansen HC, Abdi S, et al. Interventional techniques: evidence-based practice guidelines in the management of chronic spinal pain. Pain Phys 2007 Jan; 10 (1): 7-111. Disponible en: <http://www.painphysicianjournal.com/2007/january/2007;10;7-111.pdf>

14.- Neira F, Ortega JL. Guías de Práctica Clínica en el Tratamiento del Dolor. Una herramienta en la práctica clínica. Rev. Soc. Esp. Dolor 2008; 6: 399-413.

15.-Cunningham AJ, Knape JT, Adriaensen H, Blunnie WP, Buchser E, Goldik Z, Ilias W, Paver- Erzen V, Board of Anaesthesiology of the European Union of Medical Specialists. Guidelines for anaesthesiologist specialist training in pain medicine. Eur J Anaesthesiol. 2007 Jul; 24(7):568-70.



16.- De Andres J, Hayek S, Perruchoud C, Lawrence MM, Reina MA, De Andres-Serrano C, Rubio-Haro R, Hunt M, Yaksh TL. Intrathecal Drug Delivery: Advances and Applications in the Management of Chronic Pain Patient.

-e-Health Resources:

ClinicalKey Student Medicina, Odontologia y Enfermería [<https://uv-es.libguides.com/RecursosSalut>]

Acces Medicina [https://uv-es.libguides.com/Access_Medicina]

Médica Panamericana [https://uv-es.libguides.com/Medica_Panamericana]