

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

Code	33020
Name	Physiotherapy of the nervous system
Cycle	Grade
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1202 - Degree in Physiotherapy	Faculty of Physiotherapy	3	First term

Subject-matter

Degree	Subject-matter	Character
1202 - Degree in Physiotherapy	13 - Specific intervention methods in physiotherapy	Obligatory

Coordination

Name	Department
QUEROL GINER, FELIPE	191 - Physiotherapy
SENTANDREU MAÑO, TRINIDAD	191 - Physiotherapy

SUMMARY

The Physiotherapy Nervous System course pretends that student develops knowledge, skills and attitudes necessary to plan, treat and assess the physiotherapy intervention in order to promote, prevent and recover health status in the different neurological diseases, specifically in spinal cord injury; as well as peripheral nervous system and neuromuscular disorders.

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 not necessary previous requirements.

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

1202 - Degree in Physiotherapy

- 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 be able to communicate information, ideas, problems and solutions to both expert and lay audiences.
- Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.
- Work on and systematically complete physiotherapy records
- Assess a patients function, including physical, psychological and social aspects.
- Establish evidence-based physiotherapy protocols and promote professional activities that facilitate physiotherapy research.
- Perform comprehensive healthcare-based physiotherapy interventions, which involve multidisciplinary cooperation, integration of processes and continuity of care.
- Respect fundamental rights and equality between men and women.
- Recognise diversity, multiculturality, democratic values and peace culture.
- Work in teams.
- Have the ability to organise and plan work.
- Acquire knowledge related to the information and communication technologies.
- Acquire sensitivity to environmental issues.
- Know how to plan treatment goals in the different pathologies of the locomotor, respiratory, cardiovascular and nervous systems from the data of the Physiotherapy Clinical Records.
- Know how to establish a therapeutic plan to reach the proposed goals.
- Know how to apply the different physiotherapy techniques for the promotion, prevention and health preservation in the pathologies of the locomotor, respiratory, cardiovascular and nervous systems. Know how to apply manual techniques, manipulative therapy, osteopathy and chiropractic techniques.
- Know how to evaluate the physiotherapy treatment applied.



- Know how to assess the results of the physiotherapy treatment.

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

At the end of this course students should be able to:

1. Plan the objectives and physiotherapy actions necessary for the promotion, prevention and maintenance of health in the different pathologies of the nervous system based on the Clinical History in Physiotherapy.
2. Apply the different physiotherapy techniques for the promotion, prevention and maintenance of health in the different pathologies of the nervous system.
3. Assess the evolution of the patient during the physiotherapy treatment.
4. Evaluate the results obtained after the physiotherapy intervention.

DESCRIPTION OF CONTENTS

1. Introduction to Neurological Physiotherapy

Unit 1. Introduction to Neurological Physiotherapy

2. Physiotherapy in disorders of the nervous system I: Spinal cord injury (part I)

Unit 2. Fundamentals of physical therapy spinal cord Injury syndrome.

Unit 3. Neurological assessment of the injured spinal cord according to the ASIA scale. Spinal cord syndromes.

Unit 4. Assessment, functional objectives and rehabilitation in cervical spinal cord injury.

Unit 5. The hand function in people with tetraplegia.

Unit 6. Assessment, functional objectives and rehabilitation in thoracic spinal cord injury.

Unit 7. Assessment, functional objectives and rehabilitation in lumbar spinal cord injury.

Unit 8. Functional Index. Assessment of disability, activity limitations and participation restrictions for spinal cord injuries.

Unit 9. Complications associated with spinal cord injury.

Unit 10. Radiology and other complementary tests in spinal cord injury. A case report of an acute post-traumatic spinal cord injury.

3. Physiotherapy in disorders of the nervous system I: Spinal cord injury (part II)

Unit 11. Principles of Physiotherapy in the acute and subacute phase of spinal cord injury.

Unit 12. Respiratory physiotherapy in the injured spinal cord.

Unit 13. Cardiocirculatory physiotherapy in spinal cord injuries.

Unit 14. Prevention treatment and skin care. Pressure ulcers.

Unit 15. Musculoskeletal physiotherapy in spinal cord injuries. Motor training tasks and strength training.

Unit 16. Adaptation to orthostatism and sitting in spinal cord injury.



Unit 17. Basic motor tasks. Transfers and bed mobility of people with paralysis of the lower limbs. Wheelchair handling.

Unit 18. Standing and gait training in spinal cord injury I.

Unit 19. Standing and gait training in spinal cord injury II. Orthotics

Unit 20. New technologies in the rehabilitation of spinal cord injury.

Unit 21. Treatment of contractures and spasticity in the injured spinal cord.

Unit 22. Treatment of pain in the injured spinal cord.

Unit 23. Bladder and bowel management in spinal cord injuries.

Unit 24. Neurocognitive Techniques and Cognitive Therapeutic Exercise I.

Unit 25. Cognitive Therapeutic Exercise II.

Unit 26. Spinal cord injury, exercise and sport.

Unit 27. Spinal cord injury and aging.

4. Physiotherapy in disorders of the nervous system II. Peripheral nerve injury and neuromuscular disorders

Unit 28. Fundamentals of physiotherapy in the treatment of peripheral nerve injury.

Unit 29. Physiotherapy for sciatica, neuropathic cruralgia and compressive syndromes of the lower limb. System longitudinal neurodynamic: neuraxis and lower limbs.

Unit 30. Physiotherapy in cervical radiculopathy syndrome scapulohumeral chest pass, carpal tunnel syndrome and other compressive syndromes of the upper extremity neuropathic. Neurodynamic System Transverse: Upper limbs.

Unit 31. Physiotherapy neuropathic problems with conduction deficit.

Unit 32. Injuries of cranial nerves susceptible to physiotherapy treatment.

Unit 33. Physiotherapy in migraine.

Unit 34. Physiotherapy in the acquired and the hereditary polyneuropathies.

Unit 35. Physiotherapy in muscular disorders in adult and childhood. Post-polio syndrome.

5. Practical program

Practice 1. Assessment in spinal cord injury.

Practice 2. Basic motor tasks. Transfers and bed mobility and wheelchair management in spinal cord injury.

Practice 3. Physiotherapy treatment plan in spinal cord injury. Clinical reasoning.

Practice 4. Introduction to Cognitive Therapeutic Exercise I.

Practice 5. Introduction to Cognitive Therapeutic Exercise II.

Practice 6. Physiotherapy in disorders of the peripheral nervous system.

Practice 7. Physiotherapy applied to the neural pathomechanics I.

Practice 8. Physiotherapy applied to neural pathomechanics II.

Practice 9. Physiotherapy applied to neural pathomechanics III.

Practice 10. Simulation clinical cases.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Laboratory practices	15,00	100
Development of group work	25,00	0
Study and independent work	25,00	0
Preparation of evaluation activities	40,00	0
TOTAL	150,00	

TEACHING METHODOLOGY

The theoretical teaching will take place in the classroom through traditional lectures and participatory activities, as well as through flipped learning methodologies such as flipped classroom. Students will have the topics in order to facilitate the study.

Practical lessons will take place in the laboratory where the skills and specific intervention procedures contained in this subject will be trained through simulating physiotherapy techniques in the professional context, solving clinical cases and planning objectives and physiotherapeutic management.

Students will complete a portfolio of theoretical-practical activities that seek to promote inductive learning by work groups. This portfolio will be part of the continuous evaluation, aiming at encouraging the exchange of ideas and a reflexive space, as well as fostering students' active participation.

The teaching program might be modified during the development of the subject if the teaching staff considers it appropriate, in order to guarantee the teaching quality and the learning process.

EVALUATION**1. Theoretical program (60% of the final mark)**

Written test: Test with 60 questions, with 4 options and one valid option. $\text{Score} = [\text{hits} - (\text{errors} / \text{n}^\circ \text{ options} - 1)] * (\text{maximal score} / \text{number of questions})$.

2. Practical program (20% of the final mark)

- Resolution of a clinical case in which functional diagnosis and physiotherapy strategy are requested.
- Simulation of physiotherapy techniques.

3. Continuous evaluation through theoretical-practical activities of the portfolio (20% of the final mark).



The rating of the course will be averaged provided the student has earned at least 5 out of 10 in each of the theoretical and practical blocks. All written tests will be penalized spelling impropriety.

REFERENCES

Basic

- Bisbe Gutiérrez M, Santoyo Medina C, Segarra Vidal VT. Fisioterapia en Neurología. Procedimientos para restablecer la capacidad funcional. Madrid: Panamericana; 2012.
- Boldt I, Eriks-Hoogland I, Brinkhof MW, de Bie R, Joggi D, von Elm E. Non-pharmacological interventions for chronic pain in people with spinal cord injury. Cochrane Database Syst Rev. 2014;(11):CD009177.
- Cano de la Cuerda C, Collado Vázquez S. Neurorrehabilitación: métodos específicos de valoración y tratamiento. Madrid: Editorial Médica Panamericana; 2012.
- De Pablo Márquez B, Tresserras Giné G, Romero Rosich M. Manejo inicial del traumatismo vertebral en el medio extrahospitalario. FMC. 2017; 24(4):189-92.
- Esclarín de Ruz, A. Lesión medular. Enfoque multidisciplinario. 2º ed. Madrid: Médica Panamericana; 2021.
- Harvey L. Tratamiento de la lesión medular. Guía para fisioterapeutas. Barcelona: Elsevier; 2010.
- Hoppenfeld S. Neurología ortopédica. Exploración diagnóstica de los niveles medulares. 2ª ed. Barcelona: Wolters Kluwer; 2018
- International Spinal Cord Injury Society [Internet]. Disponible en: <https://www.iscos.org.uk/>
- Jacobs P. L., Nash M.S. Exercise recommendations for individuals with spinal cord injury. Sports Med. 2004; 34(11): 727-51.
- López Cubas C. Neurodinámica en la práctica clínica. 3ª ed. Barcelona: Wolters Kluwer; 2022
- Meliá Oliva JF, Valls Barberá MA. Fisioterapia en las lesiones del sistema nervioso periférico. Madrid: Síntesis; 1998.
- Saulino M. Spinal cord injury pain. Phys Med Rehabil Clin N Am. 2014;25(2):397-410.
- Seco Calvo J. Sistema nervioso: métodos, fisioterapia clínica y afecciones para fisioterapeutas. Madrid: Médica Panamericana; 2020.
- Stokes M & Stack E. Fisioterapia en la rehabilitación neurológica. 3ª ed. España: Elsevier; 2013.
- Valls Barberá MA. 35 años de Fisioterapia. Almería: SoldeSol; 2020
- Wyndaele J. J., Conservative Treatment of Patients with Neurogenic Bladder. Eur Urol Supp. 2008, 7:557-65.

Additional

- Bromley I. Tetraplegia and Paraplegia: A guide for physiotherapists. Fifth edition. Edinburg UK; 2012.
- Cameron MD. Agentes físicos en rehabilitación. 3ª ed. Barcelona: Elsevier; 2009.
- Cuenot M. Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud. EMC-Kinesiterapia - Medicina física. 2018;39(1):1-6.
- Daniels-Worthingham´s. Pruebas funcionales musculares. 9ª ed. Barcelona: Elsevier; 2014.
- Ditunno JF, Ditunno PL, Graziani V, Scivoletto G, Bernardi M, Castellano V, et al. Walking index for spinal cord injury (WISCI): an international multicenter validity and reliability study. Spinal Cord.



2000;38(4):234-43.

- Downie P. Neurología para fisioterapeutas. 4ª ed. Buenos Aires: Editorial Médica Panamericana; 2001
- Galeiras Vázquez R, Ferreiro Velasco ME, Mourelo Fariña M, Montoto Marqués A, Salvador de la Barrera S. Actualización en lesión medular aguda postraumática. Parte 1. Med Intensiva. 2017;41(4):237-47.
- Giner M, Delgado M, Miguel I, Forner JV, Miró R. Guía de autocuidados lesión medular. 1ª ed. Valencia: Generalitat Valenciana. Conselleria de Sanitat; 2001.
- Harvey L, Glinsky J, Katalinic O, Ben M. Contracture management for people with spinal cord injuries. NeuroRehabilitation. 2011; 28: 17-20.
- Hernández Rodríguez D., Tratamiento del suelo pélvico en varones con lesión medular: revisión bibliográfica. Almería: Universidad de Almería; 2017.
- Jiménez Buñuales M, González Diego P, Martín Moreno JM. La clasificación internacional del funcionamiento de la discapacidad y de la salud (CIF) 2001. Revista española de salud pública 2002;76:271-279.
- Kendall's. Músculos: pruebas funcionales, postura y dolor. 5ª ed. Madrid: Marbán; 2007.
- Krassioukov A., Eng J. J., Claxton G., Sakakibara B. M., Shum S., Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. Spinal Cord. 2010, 48:718-33.
- Pena Outeiriño J. M., Rodríguez Pérez A. J., Villodres Duarte A., Mármol Navarro S., Lozano Blasco J. M., Tratamiento de la disfunción del suelo pélvico, Actas Urológicas Españolas. 2007; 31(7):719-31.
- Rodríguez I. Lesión medular. Atención sociosanitaria. Alcalá de la real (Jaén). Ed. Alcalá; 2004.
- Roldán Álvarez A. Enfermería y lesionado medular. Coslada (madrid): Asepeyo; 2002
- Sallés L, Martín-Casas P, Gironès X, Durà MJ, Lafuente JV, Perfetti C. A neurocognitive approach for recovering upper extremity movement following subacute stroke: a randomized controlled pilot study. J Phys Ther Sci. 2017;29:665-72.
- Shacklock M. Neurodinámica Clínica. Un nuevo sistema de tratamiento músculo-esquelético. Madrid: Elsevier; 2007.
- Siddall PJ, Loeser JD. Pain following spinal cord injury. Spinal Cord 2001; 39: 63-73.
- Torres C. La Columna Cervical; Síndromes Clínicos y su tratamiento manipulativo. Madrid: Panamericana; 2008.
- Wyndaele J. J., Bruschini H., Madersbacher H., Moore K., Pontari M., Wein A., Neurological patients need evidence-based urological care, Neurourol Urodyn., 2010, 29:662-69.
- Xhardez Y. Vademecum de kinesioterapia y reeducación funcional. 5º ed. Argentina: Editorial el Ateneo; 2010.
- Zamorano E. Movilización Neuromeningea. Madrid: Panamericana; 2010
- Zarco-Periñan MJ, Barrera-Chacón MJ, García-Obrero I, Mendez-Ferrer JB, Alarcon LE, Echevarria-Ruiz de Vargas C. Development of the Spanish version of the Spinal Cord Independence Measure version III: cross-cultural adaptation and reliability and validity study. Disabil Rehabil. 2014;36(19):1644-51.