Universitat Autònoma de Barcelona

2022/2023

Physiotherapeutic Treatment in Neurology

Code: 102998
ECTS Credits: 6

Degree	Type	Year	Semester
2500892 Physiotherapy	OT	4	2

Contact

Name: Carina Salgueiro Francisco Salgueiro
Email: carina.francisco@uab.cat

Use of Languages

Principal working language: spanish (spa)
Some groups entirely in English: Yes
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: Yes

Prerequisites

Knowledgements of anatomy and physiology of the nervous system necessary to interpret typical diseases in neurorehabilitation.

Basic knowledge and practice of physiotherapy techniques.

Basic knowledge of the role of the physiotherapist in neurorehabilitation.

It is recommended to have aproved the Physiotherapy in Neurology subjects.

Objectives and Contextualisation

The objectives of the subject are:

- Lay the foundations of physiotherapeutic treatment in advanced neurology
- Deepen skills of complementary techniques applied in neurorehabilitation
- Develop clinical reasoning in neurorehabilitation for the approach of the neurological patient due to its potential complexity
- Know the different techniques of advanced neurological physiotherapy
- Practice the applicability of the different techniques of advanced neurological physiotherapy in simulated or real patients
- Learn about multidisciplinary teamwork in neurorehabilitation

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Design the physiotherapy intervention plan in accordance with the criteria of appropriateness, validity and efficiency.
- Display critical reasoning skills.
- Display knowledge of the morphology, physiology, pathology and conduct of both healthy and sick people, in the natural and social environment.
- Display knowledge of the physiotherapy methods, procedures and interventions in clinical therapeutics.
- Evaluate the functional state of the patient, considering the physical, psychological and social aspects.
- Integrate, through clinical experience, the ethical and professional values, knowledge, skills and attitudes of physiotherapy, in order to resolve specific clinical cases in the hospital and non-hospital environments, and primary and community care.
- Make a physiotherapy diagnosis applying internationally recognised norms and validation instruments.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Solve problems.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.
- Work in teams.

Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Apply advanced physiotherapy methods and techniques to neurological pathologies..
3. Communicate using language that is not sexist.
4. Consider how gender stereotypes and roles impinge on the exercise of the profession.
5. Critically analyse the principles, values and procedures that govern the exercise of the profession.
6. Define the general and specific objectives of advanced physiotherapy treatment in neurological pathologies.
7. Describe and apply advanced evaluation procedures in physiotherapy in order to determine the degree of damage to the nervous system and possible functional repercussions.
8. Describe the circumstances that condition priorities in advanced physiotherapy treatment for neurological pathologies.
9. Display critical reasoning skills.
10. Enumerate the different types of material and equipment used in advanced physiotherapy treatment for neurological pathologies.
11. Enumerate the medico-surgical treatments, mainly in the area of physiotherapy and orthopaedics, that are used in neurological diseases.
12. Establish a diagnostic physiotherapy hypothesis based on complex clinical cases in neurological pathologies.
13. Explain in detail the physiopathology of neurological diseases and identify the symptoms that appear during the process.
14. Explain the explicit or implicit code of practice of one's own area of knowledge.
15. Identify situations in which a change or improvement is needed.
16. Identify the principal forms of sex- or gender-based inequality present in society.
17. Identify the social, economic and environmental implications of academic and professional activities within one?s own area of knowledge.
18. Propose new methods or well-founded alternative solutions.
19. Propose new ways to measure success or failure when implementing innovative proposals or ideas.
20. Propose projects and actions that incorporate the gender perspective.
21. Propose viable projects and actions to boost social, economic and environmental benefits.
22. Propose ways to evaluate projects and actions for improving sustainability.
23. Solve complex clinical cases in the field of neurology.
24. Solve problems.

25. Weigh up the impact of any long- or short-term difficulty, harm or discrimination that could be caused to certain persons or groups by the actions or projects.
26. Weigh up the risks and opportunities of suggestions for improvement: one's own and those of others.
27. Work in teams.

Content

THEORETICAL-PRACTICAL CONTENT:

All the contents will be taught by Carina Salgueiro and the assistant professor.

- Scientific bases of motor control and learning.
- Early intervention and critical neurological patient and major affected.
- Review of the most useful manual techniques in neurorehabilitation.
- Stability (core stability) and mobility in neurological patients.
- Treatment of postural control and balance. Correction of gait patterns.
- Treatment and functional approach of the upper extremity.
- Treatment of sensory disorders and neuropathic pain.
- Other therapies: Virtual reality and mirror therapy; Constraint-induced movement therapy (CIMT); Whole body vibration (WBV) in neurological patients; treadmill and robotics

Methodology

There are theoretical and practical classes.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
PRACTICAL LABORATORY WORK	30	1.2	23, 2, 9, 24, 27
THEORY	10	0.4	23, 2, 6, 7, 13, 9, 24, 27
Type: Supervised			
WORK PRESENTATIONS	2	0.08	23, 2, 6, 7, 8, 10, 11, 12, 13, 9, 27
Type: Autonomous			
SELF STUDY	78	3.12	23, 2, 6, 8, 10, 9
elaboration of works and reports as well as research of information to share in classes	26	1.04	23, 2, 6, 7, 8, 10, 11, 12, 13, 9, 27

Assessment

Description of the evaluation system

Written work
Delivery of and presentation of written work done in a group
Job Note [NT] (10% of the final grade)

Exam I - Practical
Objective structured evaluation: the manual skill in the application of the different techniques will be assessed, as well as the adequacy of the chosen technique / maneuver to the situation posed. Simulation of the resolution of a clinical case / execution of a therapeutic plan between couples in 15 minutes. All necessary materials will be available in the room. Aspects related to the therapist's attitude, choice of treatment techniques, patient management and manual skills and suitability of the therapeutic plan are valued.
Practical test score [NEP] 50% of the final grade

Exam II - Theoretical
Written evaluation by means of objective tests of selection of multiple choice items (20 questions with 4 possible answers, only one will be correct, the correct answers are worth 0.35 points), open answer questions (2 questions of development in which each correct answer is worth 1 value) and short answer questions (3 questions whose correct answer is worth 0.5 points)
Note of the theoretical final exam [NET] 40% of the final grade

All evaluable tests must be done in order to pass the subject. ([NET] · 0.40) + ([NP] · 0.50) + ([NT] · 0.10) = FINAL NOTE
The subject will be approved with a final grade equal to or greater than 5.

When the student can not provide sufficient evidence of evaluation, ie, by not presenting and presenting the work and / or not to take the final exam of the subject, the record will be recorded as not assessable.
The students of exchange programs will be evaluated following the same criteria as the students of the UAB.

The recovery exam will be constituted by a theoretical part (8 questions type test, 2 open questions of short answer, 1 open question of answer of development and 1 open question related to one of the thematic proposals in the classes of self-learning) with the weight of 50% of the total assessment and a practical part (2 simulation exercises of the therapeutic approach) with the weight of 50% of the final classification.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Narrative records/porfolios	10%	1	0.04	5, 3, 6, 7, 8, 10, 11, 13, 16, 22, 20, 21, 9, 24, 27, 4, 25
Practical evaluation	50%	1	0.04	1, 23, 2, 6, 7, 8, 10, 12, 15, 26, 18, 9, 24
Theorical evaluation	40%	2	0.08	23, 2, 6, 8, 10, 11, 13, 14, 17, 19, 9, 24

Bibliography

- Nijboer TCW, Winters C, Kollen BJ, Kwakkel G. Impact of clinical severity of stroke on the severity and recovery of visuospatial neglect. PLoS One. 2018;13(7):1-11.
- Siegel J, Pizzi MA, Brent Peel J, Alejos D, Mbabuike N, Brown BL, et al. Update on Neurocritical Care of Stroke. Curr Cardiol Rep. 2017;19(67):1-11.
- Furie KL, Jayaraman M V. 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke. Stroke. 2018;49:509-10.
- Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the early management of patients with acute ischemic stroke: 2019 update to the 2018 guidelines for the early management of acute ischemic stroke a guideline for healthcare professionals from the American Heart Association/American Stroke A. Vol. 50, Stroke. 2019. 344-418
- Fearon P, Langhorne P, Blomstrand C, Cabral N, Cavallini A, Dey P, et al. Organised inpatient (stroke unit) care for stroke (Review). Cochrane Database Syst Rev. 2017;(9):1-81.

- Imura T, Nagasawa Y, Fukuyama H, Imada N, Oki S, Araki O. Effect of early and intensive rehabilitation in acute stroke patients: retrospective pre-/post-comparison in Japanese hospital. Disabil Rehabil [Internet]. 2018;40(12):1452-5.
- Dąbrowski J, Czajka A, Zielińska-Turek J, Jaroszyński J, Furtak-Niczyporuk M, Mela A, et al. Brain Functional Reserve in the Context ofNeuroplasticity after Stroke. Neural Plast. 2019;1-10.
- Sasmita AO, Kuruvilla J, Ling APK. Harnessing neuroplasticity: modern approaches and clinical future. Int J Neurosci. 2018;128(11):1061-77.
- Carey L, Walsh A, Adikari A, Goodin P, Alahakoon D, De Silva D, et al. Finding the Intersection of Neuroplasticity, Stroke Recovery, and Learning: Scope and Contributions to Stroke Rehabilitation. Neural Plast. 2019;1-15.
- Pin-Barre C, Laurin J. Physical Exercise as a Diagnostic, Rehabilitation, and Preventive Tool: Influence on Neuroplasticity and Motor Recovery after Stroke. Neural Plast. 2015;1-12.
- Carvalho R, Azevedo E, Marques P, Dias N, Cerqueira JJ. Physiotherapy based on problem-solving in upper limb function and neuroplasticity in chronic stroke patients: A case series. J Eval Clin Pract. 2018;24:552-60.
- Livingston-Thomas J, Nelson P, Karthikeyan S, Antonescu S, Jeffers MS, Marzolini S, et al. Exercise and Environmental Enrichment as Enablers of Task-Specific Neuroplasticity and Stroke Recovery. Neurotherapeutics. 2016;13:395-402.
- Crozier J, Roig M, Eng JJ, MacKay-Lyons M, Fung J, Ploughman M, et al. High-intensity interval training after stroke: An opportunity to promote functional recovery, cardiovascular health, and neuroplasticity. Neurorehabil Neural Repair. 2018;32(6-7):543-56.
- Cano de la Cuerda. Nuevas Tecnologías en Neurorehabilitación. plicacione diagnósticas y terapéuticas. Madrid: Panamericana, 2018.
- Purves D. Neurociencia . 5ª ed. Madrid: Editorial Médica Panamericana; 2016
- Shumway-Cook A, Woollacott MH. Motor Control: Translating Research into Clinical Practice.5th ed. Philadelphia: Lippincott Williams & Wilkins; 2016
- Krakauer J, Carmichael S. Broken Movement: the neurobiology of motor recovery after stroke. 2017
- Yang J, Zhao Z, Du C, Wang W, Peng Q, Qiu J, Wang G. The realization of robotic neurorehabilitation in clinical: use of computational intelligence and future prospects analysis. Expert Rev Med Devices. 2020 Dec;17(12):1311-1322.
- Wiers RW, Verschure P. Curing the broken brain model of addiction: Neurorehabilitation from a systems perspective. Addict Behav. 2021 Jan;112:106602.

Software

- Moodle
- Microsoft teams
- Face-to-face theoretical classes
- Face-to-face practical classes