

ID	2337
Curricular Unit	Neuromuscular Function
Regent	Pedro Luís Camecelha de Pezarat Correia
Learning Outcomes	<p>Identify and understand the neuromuscular factors that influence strength, power and flexibility and describe their acute and chronic adaptations to training.</p> <p>Understand the contribution of electromyography for the study of neuromuscular function and know the main processes of signal recording and processing.</p> <p>Based on kinematic and EMG data, describe the sequence of neuromuscular coordination patterns during fundamental sport skills (e.g. throwing, kicking, running, jumping).</p> <p>Know the basis of isokinetic evaluation and its utility and limitations in neuromuscular assessment of athletes.</p> <p>Know the muscular and neural sources for muscular fatigue and their relationships with different types of neuromuscular solicitation.</p>
Syllabus	<p>1 - Characteristics of skeletal muscle: mechanical model of skeletal muscle; force/length relation; force/velocity relation.</p> <p>2 - Electromyography: physiological basis, methods and studies on sport.</p> <p>3 - Organization and control of human movement: inter and intramuscular coordination mechanisms; reflex mechanisms of control; brain mechanisms of control.</p> <p>4 - Analysis of muscular patterns in sport movements.</p> <p>5 - Neuromuscular fatigue.</p> <p>6 - Neuromuscular changes with training: increase in muscle mass; muscular remodeling; neural changes.</p>
Evaluation	<p>Oral and power point presentations about the different topics followed by discussion.</p> <p>Selected readings are suggested for each topic.</p> <p>Presentation and critical discussion about some selected papers in each topic are done with special emphasis on Methodology and Results points.</p> <p>Practical EMG recording and fundamental steps of EMG processing.</p> <p>Evaluation through a written test composed by two parts: 1) American test, 2) open questions.</p>

Bibliography

- Pezarat-Correia, P. (2012). *Aparelho Locomotor, Volume II: Coordenação Neuromuscular e Adaptações à Atividade Física*. Lisboa: Edições FMH.
- Pezarat-Correia, P., & Mil-Homens, P. (2004) (Ed.). *A Electromiografia no Estudo do Movimento*. Lisboa: Edições FMH.
- Folland, J., & Williams, A. (2007). The adaptations to strength training: Morphological and neurological contributions to increased strength. *Sports Medicine*, 37, 145-168.
- Enoka, R. (2002). *Neuromechanics of Human Movement*. Human Kinetics: Champaign. IL.
- Pezarat-Correia, P. (2010). Perfil muscular do ombro de atletas praticantes de acções de lançamento. *Revista Portuguesa de Fisioterapia no Desporto*, 4, 1: 34-42. (http://www.apfisio.pt/gifd_revista/pages/inicio.php)