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## Functional neuro-rehabilitation (NRF) in small animal practice

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Functional Neuro-rehabilitation (FNR) is scientifically based in the neuro-anatomy and neurophysiology of the quadrupedal animal and bipedal human. NRF therapeutic exercises depend on a feature of the nervous system, the neuroplasticity particularly the neuroplasticity of the motor cortex, brain stem and spinal cord. The spinal cord has its own intrinsic capacity of neuroplasticity mediated by central pattern generators (CPG). Neuroplasticity should be one of the rehabilitation goals, through a balanced relationship between plasticity and functionality. The Locomotor Training (LT), a rehabilitation exercise of the FNR, promotes the activation of GPC which depend on whether there is or not input supraspinal and sensory feedback. The LT is a way for FNR to regenerate a voluntary or involuntary locomotion after an incomplete or complete spinal cord injury, respectively. FNR modalities such as transcutaneous stimulation, direct electromagnetic stimulation of the spinal cord and passive or assisted kinesiotherapy exercises can activate the GPC and still stimulate the afferent input which by itself activates the GPC, making transcortical reflex pathways, motoneurons and interneurons easily stimulated. Many locomotor training protocols in treadmill and aquatic treadmill will be addressed so that spinal neural circuits are allowed to memorize the rehabilitation exercises in practice. The aim of these exercises is to obtain an independence function for our companion animals. After an intensive study developed over 35 years, a new capability of the nervous system is approached, recognizing that the majority of spinal cord injuries are incomplete and capable of regeneration, turning FNR therapies essential.

### Biography

Angela Martins has completed her Degree in Veterinary Medicine 1991. She is the Clinical Director of the Arrabida Veterinary Hospital and of the 1<sup>st</sup> Functional Animal Rehabilitation Center-CRAA; AARV-IAVRPT Member. She has completed her Post graduation in Emergencies, Orthopedic and Neurological from University Lusofona. She has done several courses like CCRP 2012 from University of Tennessee and ESAVS-Rehabilitation and Physiotherapy of Small Animals in 2010, a course of Traumatology Orthopedic Rehabilitation in 2012. She is currently the Professor of Physical Medicine and Animal Rehabilitation at Lusofona University and Guest Professor on the same topic at the Technical University of Lisbon.

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