

## **Dynamic Neuromuscular Stabilization approach for low back pain, dysfunction and optimal performance**

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Dynamic Neuromuscular Stabilization (DNS) is a new rehabilitation strategy based on the principles of developmental kinesiology and the neurophysiological aspects of a maturing postural-locomotor system. The maturation of the postnatal central nervous system (CNS) and muscle function are related to anatomical maturation (morphological development). Postural activity occurs automatically in the course of maturation of the CNS via coordinated activity of muscles. Postural ontogenesis defines ideal posture from a developmental perspective. Optimal muscle coordination is ideal for joint loading and defines ideal motor stereotypes. The process is genetically determined and begins automatically during CNS maturation. At the age of 4.5 months, stabilization of the spine, pelvis and the chest in the sagittal plane is completed. Completion of basic sagittal stabilization is followed by the development of extremity movement patterns (i.e., supporting and stepping forward/grasping functions) coupled with trunk rotation. As such, the quality of trunk stabilization is essential for any phasic (dynamic) movement since each movement is preceded by stabilization of body segments to provide balance, efficient coordination and stability for its participating elements. DNS diagnosis is based on comparing the patient's stabilizing pattern to the developmental stabilization pattern of a healthy infant. The treatment approach emphasizes training of these ideal patterns as defined by developmental kinesiology. The brain must be properly stimulated and trained to automatically activate optimal movement patterns that are necessary for co-activation of the stabilizers. The ultimate strategy is to teach the brain to maintain central control and stability of the movement restored during therapy. This can be achieved by activation of the stabilizers when placing the patient in the developmental positions. DNS approach requires the patient's participation and compliance. Perception, i.e., the conscious feeling of the movement, is critical. The patient must differentiate between the correct "centrated movement" and the incorrect "decentrated movement" and be able to correct any "decentrated" segments. This ability depends on adequate body awareness. Daily exercise practice is a prerequisite for long lasting effects of the DNS approach to treat pain, prevent repetitive strain injury and enhance sports performance.